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**NAVAL WAR COLLEGE
Newport, R.I.**

**Centralized Command, Distributed Control, and Decentralized Execution – a Command
and Control Solution to US Air Force A2/AD Challenges**

by

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Maj, USAF

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Paper Abstract

This paper describes a three-part CC-DC-DE solution to USAF C2 challenges in A2/AD environments. This three-part solution includes the addition of a Regional Air Component Commander subordinate to the Theater JFACC, the physical distribution of USAF theater C2 systems, and the implementation of an adaptable Air Tasking Cycle. This solution will be explored over five sections in this paper. Sections one and two will frame the A2/AD “problem,” and then review research and historical solutions to A2/AD challenges. The focus of discussion will be in the third section when the CC-DC-DE solution is described at length. A counter argument against this solution will be proposed in section four and discussion will conclude with a rebuttal in section five.

Introduction

US airpower has a history of innovation to solve the challenges of Anti-Access/Area Denial (A2/AD) strategies and systems. Joint Force senior leaders have directed that this innovation is renewed to focus on the expanding challenges of A2/AD.¹²³ USAF senior leaders have established an initial vector for this innovation in the form of a transition from the historic USAF tenet of “Centralized Control, Decentralized Execution” to a new framework of “Centralized Command, Distributed Control, and Decentralized Execution” (CC-DC-DE).⁴⁵

This paper describes a three-part CC-DC-DE solution to USAF C2 challenges in A2/AD environments. This three-part solution includes the addition of a Regional Air Component Commander subordinate to the Theater JFACC, the physical distribution of USAF theater C2 systems, and the implementation of an adaptable Air Tasking Cycle. This solution will be explored over five sections in this paper. Sections one and two will frame the A2/AD “problem,” and then review research and historical solutions to A2/AD challenges. The focus of discussion will be in the third section when the CC-DC-DE solution is described at length. A counter argument against this solution will be proposed in section four and discussion will conclude with a rebuttal in section five. But first, the A2/AD problem and some clarifications will serve to frame the problem.

Framing the Problem

Framing the problem will begin by first considering current USAF capability to operate in A2/AD environments. Which characteristics of A2/AD this solution addresses will be related next. Finally, problem framing will conclude with some clarifications to focus the discussion.

Although once potent, the USAF capability to operate in A2/AD environments has atrophied.⁶ Although there are numerous contributing factors, significant force divestment and

25+ years of operations in permissive environments are the primary causes.⁷⁸ Based on smaller budgets and higher operations tempo, this “lean” force has relied on technology as its preferred form of innovation to solve A2/AD.⁹ This has also facilitated the growth of an insatiable C2 process that requires continuous information to function.¹⁰¹¹ To paraphrase Prussian Field Marshal Helmuth von Moltke, the USAF has become a force of Airmen with a “[fiber optic] wire in their back.”¹² Therefore, a fresh approach is required when studying A2/AD solutions.

A fresh approach is also helpful since the acronym “A2/AD” has been interchangeably used to describe any number of strategies, systems, or effects.¹³ Accordingly, it is necessary to specify which characteristics of A2/AD this solution addresses. Broadly, the focus of this solution is on a strategy that degrades the Joint Force’s ability to fight at tactical, operational, and strategic levels of war. Specifically, the focus of this CC-DC-DE solution is on improving the USAF’s ability to overcome the effects of an A2/AD strategy on USAF C2 processes.

Therefore, further use of the “A2/AD” acronym will be in reference to the adverse effects it has on C2 processes. Additionally, this solution will focus on the operational level (where it is needed most).¹⁴ Although this solution is applicable to any theater, it is helpful to envision the complexities of the Pacific Theater while reviewing the three-part solution (i.e., an expansive maritime theater). Finally, a minimal amount of discussion will occur on Joint Force solutions to focus on the USAF solutions to A2/AD, (and there will be no discussion of Interagency or Coalition solutions). Next is a “wave top” review of previous A2/AD research and solutions.

Previous A2/AD Research and Solutions Review

This section will begin with a brief review of USAF and Joint Force C2 solutions for A2/AD. Next, mission command and its relevance to A2/AD will be related. Finally, a WWII solution to A2/AD will be used to draw this review together.

Modern A2/AD innovation began in earnest during WWII. These solutions were primarily offensive in nature and focused on tactical execution (e.g., RADAR jamming, Chaff, etc.). The Cold War saw significant innovation and expanded C2 solutions to A2/AD. One of these solutions included a series of air plans called “Tasking By Exception” which enabled USAF Wings to operate autonomously if isolated by A2/AD.¹⁵ Unfortunately, after the Cold War, many A2/AD solutions were discarded as technology became increasingly accepted as a universal solution to the fog of war.¹⁶

The USAF continued to find innovative solutions to A2/AD in the 1990’s. One such noteworthy (and contentious) contribution to A2/AD solutions was Gen Merrill A. McPeak’s 1990 whitepaper “For the Composite Wing.” Gen McPeak’s revolutionary thesis revolved around the creation of USAF Wings that were capable of operating autonomously in A2/AD environments by empowering organic leadership through the use of mission command.¹⁷

Contemporary Joint Force A2/AD solutions began with Air-Sea Battle (ASB), and have developed into the Joint Concept for Access and Maneuver in the Global Commons (JAM-GC).^{18 19} Although tailored for A2/AD, JAM-GC is only “an operational approach to *enable* strategy” – not a true Joint Force strategy.²⁰ Therefore, it is essential that a USAF A2/AD solution use methods that are effective and adaptable to a future Joint A2/AD strategy. Mission command is one such method. Commonly used by the Joint Force and effective for C2 during degraded communications, mission command is an ideal method for C2 in A2/AD environments.

Mission command is a battle-proven method for “fighting through” the fog and friction of war. The concept is simple: commanders issue the *what*, and subordinates determine the *how*. Or, according to Joint Pub (JP) 3-30, “Mission command is the conduct of military operations through decentralized execution based upon mission-type orders....”²¹ The JP 3-0 clarifies that,

“Mission-type orders focus on the purpose of the operation rather than details of how to perform assigned tasks.”²² As stated by Dr. Vego, mission command has the benefit of breeding commanders with, “boldness, self-reliance, [and] insight into a situation...”²³ Like any C2 method, mission command is not perfect, nor is it a universal solution.²⁴ But, it does create an adaptability C2 structure ideally suited for operations in A2/AD. To illustrate this, the next section will examine a USAF leader who used mission command to address A2/AD challenges.

Gen George C. Kenney is an often-referenced USAF example of “air” mission command, but that’s for good reason.²⁵ Gen Kenney has been hailed as, “...perhaps the most effective air commander in World War II.”²⁶ When Gen Kenney took command of the Southwest Pacific Allied Air Forces in 1942, the outlook was bleak.²⁷ The command had been under continuous attack, the air war had been poorly orchestrated, and C2 was largely ineffective.²⁸ To address these challenges, Kenney reorganized his command structure, implemented mission command to increase operational tempo, and delegated authorities to empower subordinate commanders.^{29 30} That is, Gen Kenney began to solve his C2 challenges by first focusing on his *leaders*.³¹

Gen Kenney then turned his attention to the C2 *systems*. Based on frequent attacks and denied communications, Gen Kenney elected to distribute his subordinate commanders and C2 systems.³² Although the C2 systems continued to be degraded by enemy attacks, Gen Kenney’s use of mission command enabled subordinate commanders to continue operations.

Lastly, Gen Kenney focused on three overarching *procedures*: “...frequent communication of missions and commander’s intent, the establishment of standard operating procedures, and the deconfliction of forces in time and space.”³³ By standardizing the use of these procedures, Gen Kenney created an adaptable solution that addressed his *leaders*, *systems*, and *procedures* ability to operate in A2/AD environments. The forthcoming CC-DC-DE

solution will combine this three-part framework and other historical A2/AD solutions into a contemporary USAF C2 solution to A2/AD challenges.

CC-DC-DE Solution to A2/AD – Introduction

The following solution for USAF C2 challenges in A2/AD environments describes a three-part Centralized Command, Distributed Control, and Decentralized Execution (CC-DC-DE) solution. This CC-DC-DE solution proposes to use mission command to empower a subordinate *leader*, physically distribute C2 *systems*, and increases the adaptability of C2 *procedures* to enable effective USAF C2 in A2/AD environment. It is important to emphasize that a majority of this CC-DC-DE solution is focused on the *leader*.³⁴ Although the other two components of the solution are required, their primary purpose is to enable the leader to execute a more adaptable USAF C2 process. For context, this “family” of solutions represents a major change to operational leadership structure, a minor change to use of C2 systems, and a major change to C2 procedures. In depth discussion of this solution will begin with the *leader*.

CC-DC-DE Solution to A2/AD – Regional Air Component Commander (the *Leader*)

Discussion of the Regional Air Component Commander (RACC) will begin with a description of the RACC’s role. Second, how a RACC will execute DC-DE in their region will be related. Consideration of the RACC’s role will close with how the RACC will execute mission command in an A2/AD environment

The RACC is a tactical commander, directly subordinate to the JFACC, who enables the JFACC to execute Centralized Command in A2/AD. The number of RACCs in a theater will depend on the size of the theater and JFACC’s operational design. RACCs will be an O-6 to O-8 rank commander in charge of tactical air assets.³⁵ The rank of the RACC will depend on factors

like the size of the region they assigned, the size of the staff required to effectively operate that region, and the number and type of air assets assigned to that region.

For the USAF, a RACC could be a temporarily-assigned commander of an Air Expeditionary Task Force (AETF), or even a commander of multiple AETFs.³⁶ Alternatively, USAF RACCs could be a Wing Commander (WG/CC) stationed in theater, or a CONUS-based strategic asset WG/CC (e.g., B-2 WG/CC). For the Navy and Marine Corps, an Afloat-RACC (A-RACC) would command carrier air assets contributing to the JFACC's campaign plan. The A-RACC could be the Carrier Strike Wing (CSW) commander or other O-6 to O-8 level Naval Aviator in the Carrier Strike Group (CSG). The type of Navy commander most closely aligned with this role is a "Composite Warfare Commander" as defined in Navy Doctrine (NWP 3-56).

The benefit of RACCs is that the JFACC can maintain Centralized Command (CC) of a theater after theater forces are isolated from the AOC by A2/AD (e.g., communications denied). This CC is possible because the JFACC uses mission command to coordinate and empower the RACCs to conduct Distributed Control and Decentralized Execution. Although Decentralized Execution (DE) by tactical forces is intuitive, it is helpful to clarify the RACCs role in conducting Distributed Control.

Distributed Control (DC) is, "...the conditional, adaptive delegation or assumption of control activities through orders or protocols to synchronize operations, maintain initiative, and achieve commander's intent."³⁷ Thus, DC and the leader who conducts DC is the linchpin that holds this CC-DC-DE solution together.³⁸ The RACCs do this by executing the JFACC's mission-type orders that empower the RACCs to conduct DC and command DE (DC-DE) during extended periods of denied communications. As shown in Figure 1, this adaptable solution is in contrast to the USAF's traditional "Centralized Control Decentralized Execution" C2 process.

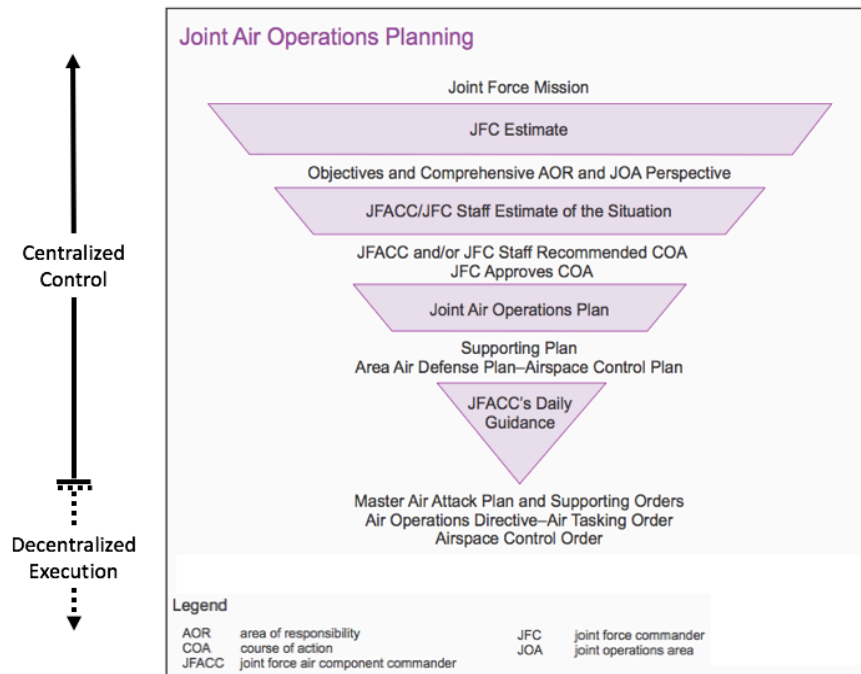


Figure 1. Current USAF C2 Process (from Joint Pub 3-30).³⁹

As depicted in Figure 2, this CC-DC-DE solution is optimized for operations in A2/AD with a more “flat,” forward-deployed, and adaptable command structure.^{40 41 42}

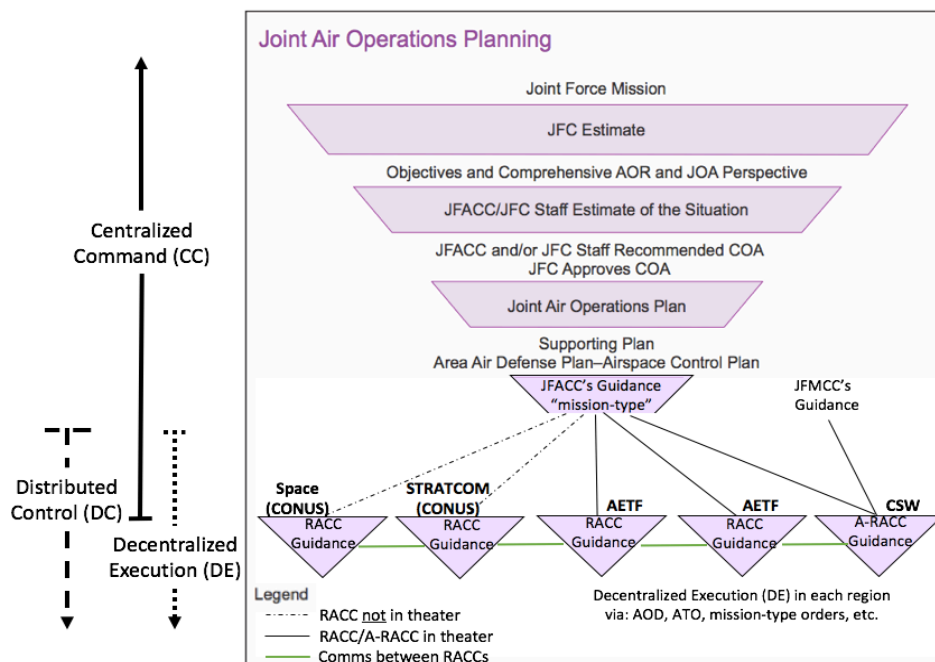


Figure 2. CC-DC-DE Solution to USAF Command and Control in A2/AD.

To conduct CC-DC-DE, the JFACC and RACCs will leverage a current doctrinal C2 method called “distributed operations.”⁴³ The JFACC will conduct distributed operations using a “continuum of C2.”⁴⁴ USAF Doctrine says this continuum can vary, “between direct control” and “total autonomy.”⁴⁵ In addition to this continuum, the JFACC’s will also execute CC through their operational design, designation of supported/supporting RACC relationships, and designating when those RACC relationships will change. This will empower the RACCs to conduct the challenging task of synchronizing air operations both in and out of theater (e.g., with CONUS RACCs) and amongst multiple regions and services (e.g., the A-RACC).^{46 47}

Even though the RACCs are empowered, the JFACC still retains CC via their Commander’s Intent and the mission-type orders issued to the RACCs. When communications are uncontested, the effectiveness of this mission command CC solution is comparable to the current C2 process. However, when communications are degraded or denied, this method of CC provides the JFACC with sufficient command of the theater when the current C2 process would quickly fail. Thus, mission command is required for the JFACC to maintain CC in A2/AD.

In addition to mission-type orders, the “USAF version” of mission command will also include the additional guidance necessary to coordinate air operations. Guidance will largely be via “standard” USAF products and documents, but the amount of this guidance to the RACCs will vary based on which air tasking cycle is being used (which will be discussed in the forthcoming “DCDE-Cycles” section). In general, this guidance will be documents like the Joint Air Operations Plan (JAOP), the Air Operations Directive (AOD), and the Air Tasking Order (ATO).^{48 49} Additionally, the JFACC would use “standing” guidance like a Defended Assets List (DAL), Rules of Engagement (ROE), Special Instructions (SPINS), and any mission-type orders necessary to provide the RACCs with the authority to conduct DC-DE in their regions.⁵⁰

Finding the correct balance of standard products (i.e., centralized command) and mission command (i.e., distributed control) will be difficult.⁵¹ Fortunately, a significant amount of USAF research and Joint Force effort has been conducted to aid the JFACC and the RACCs in finding this balance while executing mission command.⁵²⁵³⁵⁴⁵⁵ Only with a thoughtful use of mission command will the *leader* be able to adapt this CC-DC-DE solution to the dynamic challenges of an A2/AD environment. With the role of the RACC considered, discussion will continue with how the RACC will execute Distributed Command using a distributed USAF C2 *system*.

CC-DC-DE Solution to A2/AD – Distributed Theater Air Control System(the System)

The use of mission command is essential to a CC-DC-DE solution, but it is not a “panacea” for all USAF C2 problems.⁵⁶⁵⁷ The JFACC will also need a C2 *system* that is as flexible as each of the RACCs. This *system* solution will be presented by first describing the concept of the Distributed Theater Air Control System (D-TACS), and then how the D-TACS will facilitate a CC-DC-DE solution in an A2/AD environment.

In general, the Theater Air Control System (TACS) is the JFACC’s “mechanism for commanding and controlling component air and space power.”⁵⁸ As a system-of-systems, the TACS must be adaptable and deliberately designed by the JFACC to facilitate mission command. One such method for designing an adaptable TACS is “split ops.”⁵⁹ Split ops is conducted by a single commander (the JFACC) and it enables an AOC’s C2 processes to be distributed out to Geographically Separated Units (GSU).⁶⁰

D-TACS implements split ops through two primary changes to current C2 structures. First, is the restructuring and physical distribution of existing systems to provide the RACC with sufficient *capability* to conduct DC-DE. Second, is the distribution of some C2 personnel from

the AOC and into each of the regions to provide the RACCs with sufficient *capacity* to conduct DC-DE. The primary purpose of organic D-TACS capability and capacity in each region is to avoid centralizing all of the situational awareness (SA) in the AOC and to provide the RACCs with sufficient SA to conduct DC-DE in an A2/AD environment.

The distribution of the physical D-TACS systems would be through the use of “high-low mix” design. The “high” portion of the design would remain the AOC with its numerous backup or “retrograde” locations.⁶¹ The “low” portion of the design could be Control and Reporting Centers (CRCs), Airborne C2 platforms (e.g., E-3’s, E-8’s) and even transport aircraft (e.g., to deliver personnel or information to a region).⁶² Joint Force assets in the “low” portion could also include Joint C2 platforms (USS Blue Ridge, E-6 Mercury, etc.) and transport aircraft (e.g., Navy C-2 delivers an ATO and mission-type orders to the A-RACC).⁶³

During operations, the adaptability of a D-TACS enables the RACCs to operate autonomously and “fight through” A2/AD with their organic capability and capacity. Ideally, a region’s D-TACS design would also enable the RACCs to move portions of their D-TACS within the region to “fight around” A2/AD effects.⁶⁴ In phases with reduced A2/AD effects, the JFACC retains the authority to consolidate portions of the D-TACS back to the AOC to increase efficiency through centralized operations.^{65 66} In all, this adaptable use of C2 systems facilitates the JFACC’s ability to conduct CC through mission command since the RACCs have sufficient SA to conduct DC-DE in accordance with the JFACC’s intent. To complete this CC-DC-DE solution, the D-TACS must also be accompanied by updated *procedures*.

CC-DC-DE Solution to A2/AD – DCDE Air Tasking Cycle (the *Procedures*)

These *procedures* are the final portion of this CC-DC-DE solution to A2/AD. These procedures will be described in four parts, beginning with an overview of the DC-DE Air

Tasking Cycle concept (DCDE-Cycle). Subsequently, each of the three DCDE-Cycles (typical, distributed, and Tasking By Exception) will be reviewed. It is necessary to clarify that the use of the "DCDE" naming convention is because a majority of these procedures will be conducted by the RACCs through DC-DE.⁶⁷ The "CC" of CC-DC-DE is removed solely to distinguish the unique nature of these DCDE-Cycles – *not* because the JFACC is isolated from these cycles.

Although the following DCDE-Cycles are unique, the Air Tasking Cycle is always, “at the heart of the USAF battle rhythm.”⁶⁸ As depicted in Figure 3, the currently-fielded “Typical Air Tasking Cycle” is informed by a variety of sources (e.g., JOPP, JOPPA, JIPOE, JIPTL, etc.).⁶⁹ Although well informed, the Typical Tasking Cycle has difficulty with continuous operations in an A2/AD environment.⁷⁰ Therefore, a more adaptable Tasking Cycle is required to solve A2/AD challenges.

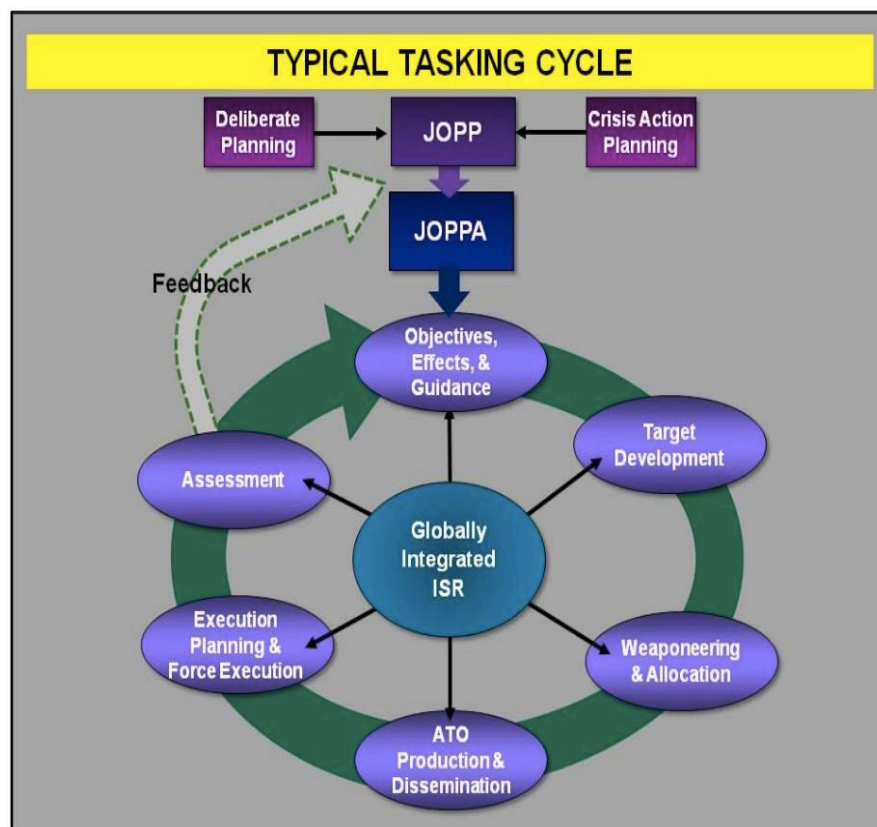


Figure 3. Typical Air Tasking Cycle (from AF Doctrine Volume III).⁷¹

DCDE Tasking Cycles provide the JFACC with three tasking cycle options: the current “Typical Tasking Cycle,” a “Distributed Tasking Cycle,” and a “Tasking by Exception” (TBE) Cycle. The benefit of these options is the increased adaptability they provide to the RACCs to execute the JFACC’s intent. Rather than a region’s operations ceasing within 24 hours of being cut-off from the AOC, the RACCs can continue operations by “stepping” through the DCDE-Cycle options. The RACCs would transition to a specific DCDE-Cycle based on the JFACC’s operational design, the D-TACS design, and the JFACC’s mission-type orders. Transitions between the DCDE-Cycles would occur when pre-determined “trigger” criteria are met (e.g., OPLAN activation, specified event or time, etc.). These triggers would also be informed by communication levels between the JFACC and RACC. Figure 4 depicts this “one to five” Comm Level scale, with the most communication capability at level 5, and the least at level 1.

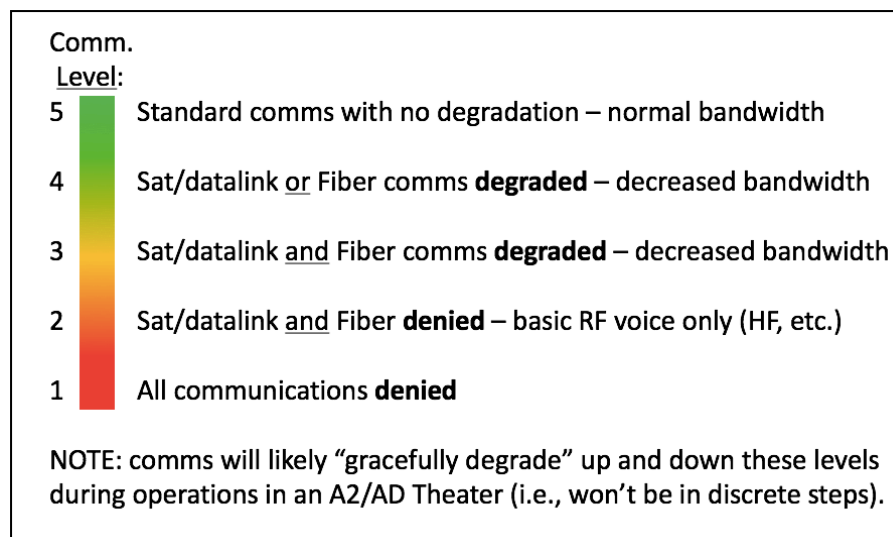


Figure 4. 1 to 5 Scale of Communication Level Between JFACC and RACCs.

In addition to enemy action that degrades Comm Levels, the JFACC and RACCs should also consider transitioning through DCDE-Cycles based on Joint Force Tactics, Techniques, and Procedures (TTP) (e.g., Navy CSG executing EMCON). With this foundation on the concept, in depth review will begin with the first DCDE-Cycles, the Typical Tasking Cycle.

To increase the adaptability of the DCDE-Cycles, the proven Typical Tasking Cycle will continue to be used.⁷² USAF Doctrine describes how this cycle remains effective by being “...bi-directional, iterative, [and] multidimensional....”⁷³ Figure 5 is an excerpt from USAF Doctrine that illustrates the “Typical Tasking Cycle.”⁷⁴ An overlay has been added to show the normal distribution of planning processes and to emphasize the centralized nature of this cycle.

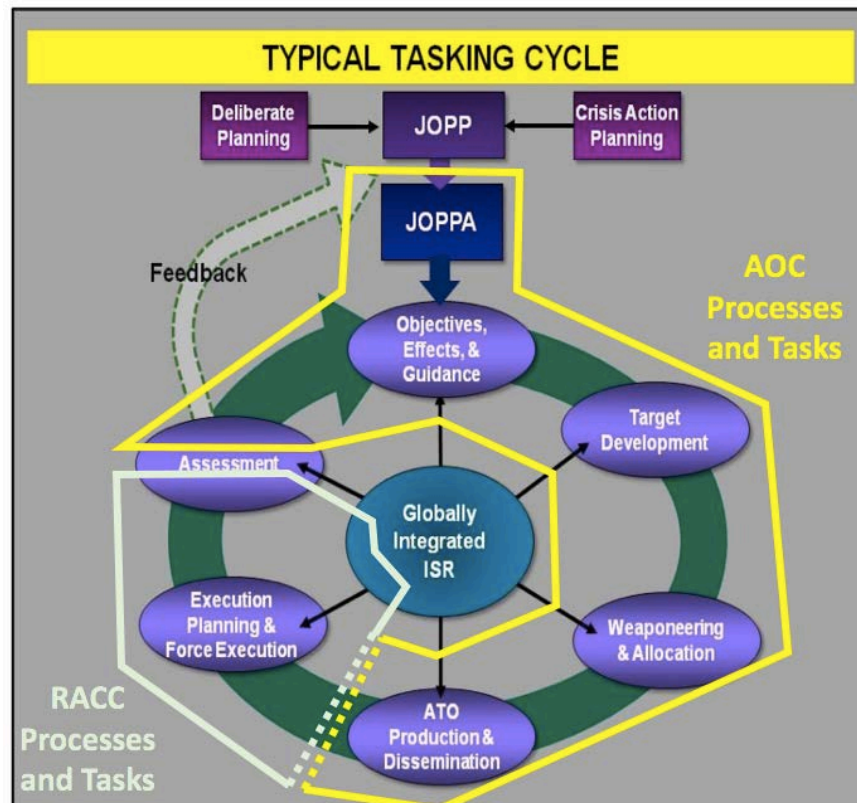


Figure 5. DCDE-Cycle #1 of 3: Typical Air Tasking Cycle.

The primary requirement to use this cycle is a sufficient Comm Level for the JFACC to maintain SA on each region's capacity, capability, and readiness. Although adaptable, the Typical Tasking Cycle is admittedly inadequate under continuous A2/AD effects.⁷⁵ Therefore, additional tasking cycle options are required, like a Distributed Tasking Cycle.

The second DCDE-Cycle option is a “Distributed Tasking Cycle.” The primary difference between a Typical Cycle and a Distributed Cycle is that “lower bandwidth”

components of the C2 process are distributed to the RACCs and “bandwidth-heavy” aspects of the tasking cycle are maintained at the AOC or areas less impacted by A2/AD.⁷⁶⁷⁷ The distribution of processes could be standardized for the entire theater, or tailored to each region.

If distribution is “standardized,” time-intensive tasks (like weaponeering and intelligence analysis) could be conducted in the regions, while bandwidth-heavy tasks (like imagery analysis) could remain in the AOC.⁷⁸ Alternatively, the distribution of tasks could be tailored to the size of a region. More processes would be distributed to the larger regions (with more capable D-TACS and larger RACC staffs), while fewer processes would be distributed to the smaller regions. Figure 6 illustrates the Distributed Tasking Cycle. The dashed line on the overlay to Figure 6 depicts which portions of the cycle could be distributed to the RACCs.

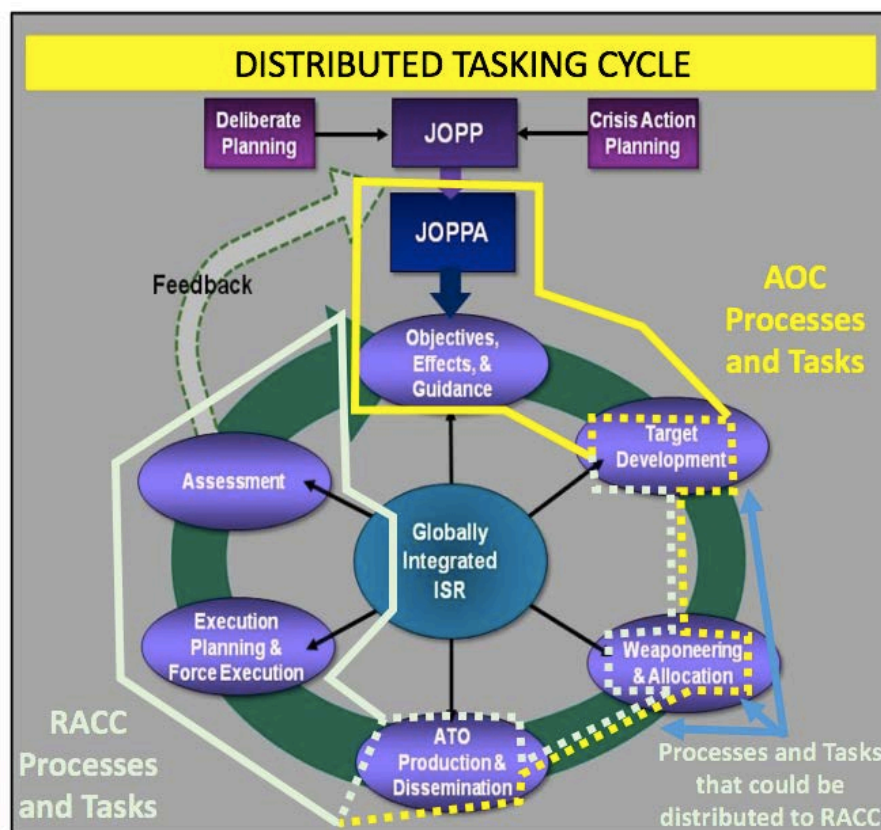


Figure 6. DCDE-Cycle #2 of 3: Distributed Air Tasking Cycle.

An essential requirement for TBE is that the JFACC delegates sufficient authorities to the RACCs to conduct the delegated processes. A second requirement is a Comm Level between 2 and 5 (depending on how much of the tasking cycle was distributed). Although a distributed cycle is effective with intermittent Comm Level 1, it is not intended for continuous use at this level. Prolonged time at Comm Level 1 would “trigger” a transition to a Tasking by Exception.

A Tasking by Exception (TBE) Cycle is pre-planned or “off the shelf” air tasking cycle. The purpose of TBE is to give the RACCs a method to continue the air tasking cycle during extended periods at Comm Level 1. When a TBE is “triggered,” a RACC who had been executing a typical or distributed cycle would transition to executing the TBE Cycle. The RACC would use the JFACC-delegated authorities to tailor the TBE in accordance with their D-TACSS capabilities and the last mission-type orders they received from the JFACC.⁷⁹ Figure 7 illustrates how TBE remains a true “cycle” even though a majority of this cycle is pre-planned.

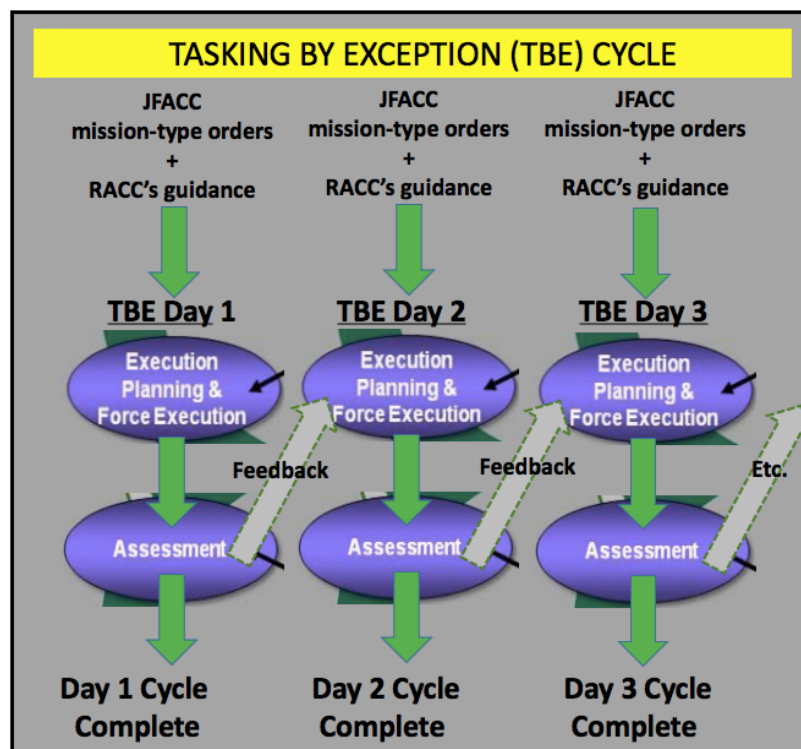


Figure 7. DCDE-Cycle #3 of 3: Tasking By Exception (TBE) Cycle.

After a TBE is “triggered,” that region will transition to a TBE Cycle. The RACCs conducting TBE will conduct DC-DE and use organic forces to execute the assigned missions.⁸⁰ The other RACCs still executing typical or distributed cycles will be advised of the TBE and will either de-conflict or integrate their operations with the TBE (based on JFACC intent). A TBE would normally only cover execution for a single region. But, based on the JFACC’s operational design, multiple regions could conduct coordinated TBE (e.g., after OPLAN activation).

The requirements to execute a TBE are specific “trigger” criteria that invoke a RACC's authority to transition to TBE for their region. Some examples of these criteria are: 24 hours at Comm Level 1, 24 hours at EMCON Alpha (for the A-RACC), or upon notification that the AOC is being evacuated to a rear-echelon location.⁸¹ With the final aspect of this three-part CC-DC-DE solution presented, it is helpful to “tie it all together” with an illustration.

CC-DC-DE Solution to A2/AD – Illustration of the CC-DC-DE Solution

The following illustration relates how a JFACC might apply this CC-DC-DE solution during combat in an A2/AD environment. As hostilities commence, Figure 8 depicts how each RACC's Comm Level will fluctuate based on A2/AD effects, combat TTP, and the fog of war.

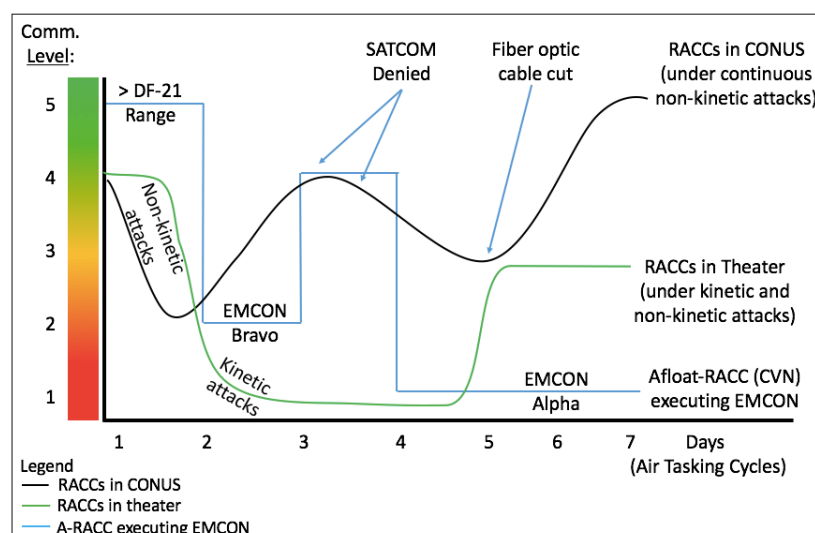


Figure 8. Theater Comm Levels Over Seven days of the Air Tasking Cycle.

As Comm Levels vary and the fog of war spreads, the RACCs maintain high operations tempo by executing the JFACC's mission-type orders. On Day 2, the RACCs meet their criteria to transition to Distributed Tasking Cycles. As each region's D-TACS workload increases under the strain of continuous Distributed Cycles, most regions are able to "fight through" A2/AD.

However, the RACCs located in theater are unable to continue Distributed Cycles based on enemy strikes and higher levels of A2/AD effects. When these RACCs meet their TBE "trigger" criteria, they transition to TBE. Figure 9 depicts how this "stepped" process would look as each of the RACCs use their D-TACS to transition through the DCDE-Cycle options.

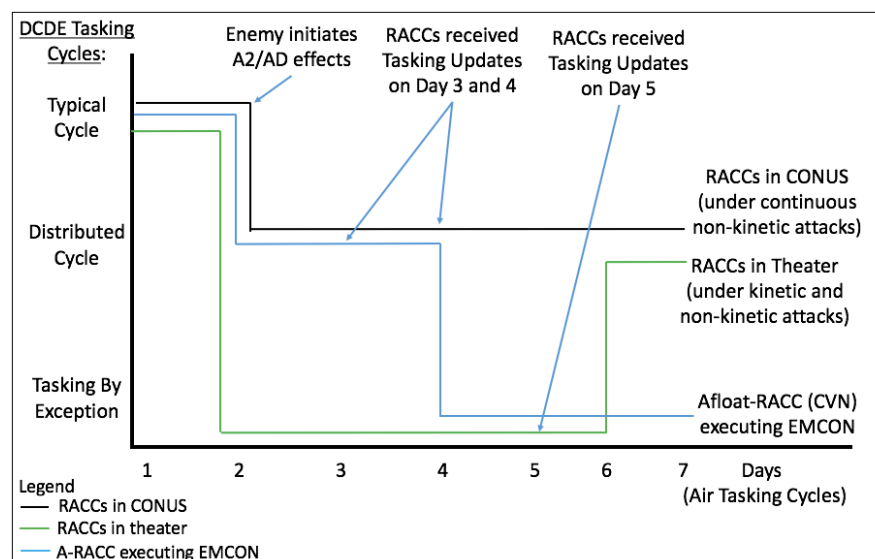


Figure 9. DCDE Tasking Cycle Transitions Over Seven days of the Air Tasking Cycle.

Figure 9 also shows how the RACCs are able to conduct DC-DE in accordance with the JFACC's intent, even at low Comm Levels. As shown over days 2 and 3, if a region is unable to "fight through" the A2/AD effects, the RACCs are empowered to "fight around" A2/AD by transitioning to a different DCDE-Cycle. After several days of high-tempo operations, the in theater RACCs are able to successfully defend their regions. Thus, as the A2/AD effects momentarily decrease, these RACCs are able to regain a sufficient Comm Level to transition

back to a Distributed Cycle. This timing is also ideal for the JFACC as the A-RACC is now EMCON and executing TBE in support of the Joint Force Maritime Component Commander (JFMCC). Although this example highlights CC-DC-DE's ability to operate at "the speed of the problem," it is crucial to deepen this conclusion with consideration of an alternative opinion.⁸²

Counter Argument: a CC-DC-DE Solution is *Not* Required to Solve A2/AD Challenges

The following counter-argument pays credence to three ideas or mindsets that attack a portion of this *leader, system, and procedure* solution. The first idea is that this solution is too decentralized and decreases a JFACC's ability to *lead*. That is, this CC-DC-DE solution is too far to the "decentralized" side of the USAF's "Continuum of C2" and appears to violate the USAF's tenets of airpower.^{83 84} As a result, this change dilutes airpower and prevents effective consolidation. For example, a RACC may not possess the organic airpower to defend against a massed air attack. Even if the JFACC can contact the RACC, air assets are too diluted to be effective. Thus, this solution reduces the JFACC's ability to *lead* in A2/AD

This solution also waters-down the current *system's* technical capabilities. A recent study supported the conclusion that Distributed Control is not required since cyber solutions and AOC bandwidth management are sufficient to ensure that the Internet Protocol will always get through.⁸⁵ This CC-DC-DE solution also assumes that the enemy has sufficient capability to challenge an AOC's robust cyber defenses.⁸⁶ Lastly, the US government is always developing new systems to overcome A2/AD, like DARPA's Tactical Undersea Network Architecture (TUNA) system that establish "...temporary underwater fiber-optics communications...."⁸⁷ Therefore, the current *system* is sufficient and a CC-DC-DE solution is not required in A2/AD.

Finally, even if this solution was effective, it is not possible to implement these *procedures* due to the high cost of training personnel. This dynamic use of the D-TACS

personnel does not consider the unique and theater-specific nature of an AOC.⁸⁸ In reality, it would be costly to train AOC personnel and then deploy them to another portion of the D-TACS and expect the same performance.⁸⁹ Finally, learning to use mission command will be a slow process, and will have a high cost in time. Although these assaults on this solution are genuine, they are decidedly optimistic. Thus, it is important to use a more pragmatic lens in the rebuttal.

Rebuttal: a CC-DC-DE Solution *is* Required for Effective USAF C2 in A2/AD

This rebuttal will consider each of these three arguments in turn, beginning with the argument that this solution reduces the JFACC's ability to *lead*. Although the transition away from centralized command may not be comfortable, or even desired, it is absolutely required. Although USAF Doctrine is reasonably current, the rapid advance of A2/AD has seemingly outpaced doctrinal updates. Therefore, it is essential to avoid a dogmatic view that this is a *violation* of the tenets, and instead use a pragmatic lens that sees this solution as a natural *evolution* of the tenets of airpower. Accordingly, this solution increases the JFACC's ability to lead through Centralized Command and empowers the RACCs to conduct Decentralized Control.

This CC-DC-DE solution also applies a pragmatic perspective to the D-TACS system. Although it is a nice idea that our enemies won't attack our C2 process, it is not grounded in reality. We will not fight a "potted plant," the enemy is a thinking and learning enemy. Even if the enemy can't think, concerted cyber-attacks enable them to steal our vulnerabilities and methods. Our enemy gets a vote. Even if it was possible to completely secure the cyber domain, the enemy could exploit vulnerabilities in other domains. Therefore, no matter how robust we feel our *systems* are, a CC-DC-DE solution is essential for C2 in A2/AD.

Finally, implementing CC-DC-DE *procedures* is possible within current resource constraints. To this end, CC-DC-DE processes could be implemented in low-intensity or

uncontested air theaters (e.g., CENTCOM, AFRICOM). This would provide C2 personnel with combat experience in these procedures and generate essential lessons learned. Alternatively, JFACCs and AOCs could practice the CC-DC-DE processes during presently existing Flag Level exercises (e.g., NORTHERN EDGE, RED FLAG, etc.). Finally, implementation could begin with the “standard” use of mission command for in garrison training and exercises at the operational and tactical levels. As Gen Dempsey stated, “[o]fficers must be taught how to receive and give mission-type orders....”⁹⁰ Therefore, it is evident this CC-DC-DE solution is valid and is required to address the USAF’s C2 challenges in an A2/AD environment.

Conclusion

This paper described a three-part CC-DC-DE solution to USAF C2 challenges in A2/AD environments. This *leader, systems, and procedures* solution included the addition of RACCs subordinate to the Theater JFACC, a Distributed-TACS, and an adaptable DCDE Air Tasking Cycle. To increase the USAF’s current momentum on A2/AD solutions, it is essential to continue research in several key areas.

First, research should continue to codify past and present corporate knowledge on DC-DE processes (e.g., Cold War TBE lessons learned, contemporary JFACCs using “split ops,” etc.). Second, research should focus on Joint Force integration and Coalition participation in a USAF CC-DC-DE solution (which will be complex).⁹¹⁹² Finally, although technology will never completely clear the fog of war, it is an effective force multiplier. Therefore, technology and emerging capabilities must continue to be investigated (e.g., the “combat cloud”).⁹³⁹⁴

A2/AD is a dynamic family of problems that is constantly evolving. Innovation is essential to developing and sustaining a USAF solution to A2/AD. As demonstrated by Gen Kenney, it is essential to address these challenges, “[t]he status quo is not an option.”⁹⁵

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